

REMARKS

The Applicant has now had the opportunity to carefully consider the comments set forth in the Office Action that was mailed May 7, 2009. All of the rejections are respectfully traversed. Amendment, re-examination and reconsideration are respectfully requested.

The Office Action

In the Office Action that was mailed May 7, 2009:

claim 1 was rejected under 35 USC §112, second paragraph, for allegedly including errors in antecedence;

claim 9 was rejected under 35 USC §112, second paragraph, for allegedly including errors in antecedence;

claims 1-9 were rejected under 35 USC §112, second paragraph, for allegedly failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention for including the abbreviation --RNSS-- without definition;

claims 1-5 and 9 were rejected under 35 USC §102(b) as allegedly being anticipated by U.S. Patent No. 5,815,539, which was cited by the Applicant; and

the Information Disclosure Statement filed on February 21, 2006 was objected to for allegedly failing to include a legible copy of each cited foreign patent document.

The Present Application

By way of brief review, the present application is directed toward methods for validating the detection of a correlation peak detected between a signal transmitted by a plurality of navigation satellites and a local replica generated by a receiver, said replica being of a spread spectrum signal characteristic of a particular satellite. The method includes comparing a determined correlation function with a theoretical autocorrelation function over the whole of the vector of the correlation function. For instance, once a main peak has been detected in a correlation function, a verification is performed that compares the correlation function obtained from the received signal with the theoretical autocorrelation function. The main peak corresponds to the highest peak of the calculated correlation function. In practice, detecting the main peak of the correlation function enables an assumed synchronization time to be determined. The theoretical

autocorrelation function is calculated to obtain a main peak centered on the synchronization time. The two functions therefore have a main peak around the assumed synchronization time. The two functions also have secondary peaks or lobes. By comparing the secondary peaks, that is to say by verifying whether they occur at the same time, a deduction is made with regard to whether the detected main peak is in fact associated with the satellite that is being looked for (paragraph 20).

The Cited Document

In stark contrast, the primary reference of the Office Action to Lennen **does not disclose** comparing a correlation function with a theoretical autocorrelation function as a function of time of spread spectrum signal over the whole of the vector of the correlation function. For example, Lennen **does not disclose or suggest** comparing secondary peaks (e.g., compare the depiction of secondary peaks 5 and 7 in Fig. 1 of the present application to any of Figs 1, 4, 5, 7, 8, 9, 10, or 13 of Lennen). Where the present application is concerned with identifying the satellite associated with the signal, Lennen is concerned with characterizing multipath induced distortions in an autocorrelation function of a correlation receiver in order to reduce effects of these multipath induced distortions on the accuracy of detecting the time of arrival of a signal (Abstract).

The Claims Particularly Point Out and Distinctly Claim the Subject Matter Which the Applicant Regards As the Invention

Claim 1 was rejected for allegedly including insufficient antecedence basis for the recitation “determining the correlation function”.

However, while it is respectfully submitted that, as explained at MPEP §2173.05(e), “inherent components of elements recited have antecedent basis in the recitation of the components themselves. For example, the limitation ‘the outer surface of said sphere’ would not require an antecedence recitation that the sphere has an outer surface.” In the present case, **claim 1** recites --a correlation peak--. Accordingly, a correlation function is inherent.

Nevertheless, in the interest of compact prosecution, **claim 1** has been

amended to recite --determining a correlation function--.

Additionally, the phrase --the theoretical autocorrelation-- has been amended to recite "a theoretical autocorrelation function".

Claim 9 was rejected for allegedly including insufficient antecedent basis for the recitation of "determining the correlation function". In this regard, arguments similar to those submitted above with regard to **claim 1** are submitted in support of **claim 9**.

Nevertheless, in the interest of compact prosecution, **claim 9** has been amended in a manner similar to that described above with regard to **claim 1** to recite --determining a correlation function-- and --a theoretical autocorrelation function--.

Claims 1-9 were rejected under 35 USC §112, second paragraph, for including the abbreviation "RNSS".

However, independent **claims 1** and **9** have been amended to recite --radio navigation satellite system (RNSS)--. Accordingly, **claims 1-9** now include the definition required by the Office Action.

For at least the foregoing reasons, withdrawal of the rejections of **claims 1-9** under 35 USC §112, second paragraph, is respectfully requested.

The Claims Are Not Anticipated

Claims 1-5 and **9** were rejected under 35 USC §102(b) as being anticipated by Lennen.

With regard to the recitation in **claim 1** of --said method being characterized in that it further includes a step of comparing said correlation function with the theoretical autocorrelation function as a function of time of said spread spectrum signal characteristic of said satellite that is being looked for over the whole of the vector of the correlation function, the Office Action cites column 2, lines 6-11; lines 25-45, and column 2, line 53-column 3, line 3, as well as Fig. 10 and associated disclosure of Lennen.

However, column 2, lines 6-11, indicates that, "Determining the time of arrival of a signal requires the recognition of at least a portion of the incoming signal and a comparison of the time of arrival of the incoming signal with the time that it was known to have been transmitted." In this regard, it is respectfully submitted that Lennen is

directed to analysis of only a portion of the signal vector (that associated with the main correlation peak) and column 2, lines 6-11, **do not disclose** comparing a correlation function with a theoretical autocorrelation function. Moreover, column 2, lines 6-11, **do not disclose** such a comparison being made over the whole of the vector of the correlation function.

Column 2, lines 25-45, describe a correlation process and even indicate that an autocorrelation function is generally observed as a series of correlation spikes output from a matched filter in a correlator circuit.

However, the cited portion of column 2 **does not disclose or suggest comparing** those results to a theoretical autocorrelation function. Moreover, the cited portion **does not disclose or suggest** comparing those results to a theoretical autocorrelation function over the whole of the vector of the correlation function.

Column 2, line 53-column 3, line 3, indicates that an ideal autocorrelation function between two spread spectrum codes is shown by spike 10 in Fig. 1. In this regard, it is noted that **Fig. 1 of Lennen does not disclose or depict secondary spikes**. In this regard, it is respectfully submitted that Lennen is not concerned with comparing the whole vector. Instead, Lennen is concerned only with the main peak or spike 10. The cited portion goes on to indicate that a true autocorrelation function in a real receiver is somewhat different from the ideal and is shown by curve 12 in Fig. 1. It is respectfully submitted that Lennen is concerned with addressing the non-ideal nature of this “true autocorrelation function” and is not concerned with validating that a detected correlation peak is associated with a particular satellite being looked for. It is respectfully submitted that Lennen assumes that the detected peak is associated with a particular satellite.

Cited Fig. 10 is a plot of a composite autocorrelation function showing how the autocorrelation function contracts due to canceling multipath (column 9, lines 41-45). Three curves are shown in Fig. 10. They are a composite autocorrelation function 118, a direct path autocorrelation function 120 and a negative multipath signal 122. As explained at column 10, lines 7-16, Fig. 10 shows the composite autocorrelation function 118 as being affected by distortions induced by the negative multipath signal 122. The composite function 118 is contracted in time by more than one time unit from

a direct path autocorrelation function 120 at an amplitude level of 0.6 due to the negative multipath signal. Such contraction of the composite function 118 occurs when the delayed multipath signals are out of phase with the carrier phase of the primary signal.

It is respectfully submitted that Fig. 10 **does not disclose** comparing a correlation function with a theoretical autocorrelation function as a function of time of said spread spectrum signal characteristic of said satellite that is being looked for over the whole of the vector of the autocorrelation function, as recited in **claim 1**.

For at least the foregoing reasons, **claim 1**, as well as **claims 2-8**, which depend therefrom, is not anticipated by Lennen.

Additionally, **claim 1** has been amended to include the subject matter previously recited in **claim 3**. Accordingly, **claim 1** further indicates that comparing said correlation function with the theoretical autocorrelation function includes comparing secondary peaks of each of said functions. As indicated above, it is respectfully submitted that Lennen **does not disclose or suggest** comparing secondary peaks of a correlation function with secondary peaks of a theoretical autocorrelation function. In this regard, the Office Action cites Fig. 9 and associated disclosure without further comment.

However, as explained at column 9, lines 39-41, Fig. 9 of Lennen is a plot of a composite autocorrelation function showing how the autocorrelation function expands due to multipath and showing timing definitions. As explained at column 9, line 64-column 10, line 6, Fig. 9 shows a composite autocorrelation function 112 that has been affected by distortions induced by a positive multipath signal 116. In particular, the composite function 112 is shown in expanded form due to the delayed signals being in phase with the carrier portion of the primary signal. Thus, in Fig. 9 of Lennen, for example, as a result of the multipath signal 116, the composite autocorrelation function 112 is expanded in time by one time unit from a direct path autocorrelation function 114 at the amplitude level 0.6.

Accordingly, Fig. 9 **does not disclose or suggest** that a comparison of a correlation function with a theoretical autocorrelation function includes comparing secondary peaks of each of said functions (e.g., see the comparisons depicted in Fig. 1

and Fig. 2 of the present application).

For at least the foregoing additional reasons, **claim 1**, as well as **claims 2** and **4-8**, which depend therefrom, is not anticipated by Lennen.

Claim 9 was rejected together with, and for the same reasons as, **claim 1**. Accordingly, arguments similar to those submitted in support of **claim 1** are submitted in support of **claim 9**. Additionally, **claim 9** has been amended in a manner similar to that described above with regard to **claim 1** to include subject matter originally recited in **claim 3**.

For at least the foregoing reasons, **claim 9** is not anticipated by Lennen.

Claim 2 depends from **claim 1** and is not anticipated by Lennen for at least that reason.

With regard to **claim 4**, the Office Action cites Figs. 14-15 and “associated disclosures” of Lennen.

However, as explained at column 9, lines 54-60, of Lennen, Fig. 14 is a flowchart showing steps to be followed to eliminate multipath effects according to an embodiment of the invention of Lennen, and Fig. 15 is another flowchart showing the steps to be followed to eliminate multipath effects according to another embodiment of the invention of Lennen. Even though reference numeral 160 of Fig. 14 is associated with the word --compare--, Figs. 14 and 15 and their associated discussions **do not disclose or suggest** that a comparison between a correlation function and a theoretical autocorrelation function includes calculating a correlation between said correlation function and said autocorrelation function, as is recited in **claim 4**.

For at least the foregoing additional reasons, **claim 4** is not anticipated by Lennen.

Claim 5 depends from **claim 1** and is not anticipated by Lennen for at least that reason.

It is noted that the Office Action does not reject **claims 6-8** as being anticipated by Lennen and that the only reason for rejecting **claims 6-8** presented in the Office Action is their dependence on **claim 1** and the rejection of **claim 1** for including the abbreviation RNSS without definition.

However, **claim 1** has been amended to include the required recitation of radio

navigation satellite system. Accordingly, **claims 6-8** are allowable.

Please Consider the Cited Documents

The Office Action objected to the Information Disclosure Statement filed on February 21, 2006 for failing to include a legible copy of each cited foreign patent document.

However, a replacement Information Disclosure Statement is being filed herewith along with copies of the cited documents. Additionally, an English language Abstract and related U.S. patent of one document and a machine translation of another document were located and are being provided. Accordingly, consideration thereof is respectfully requested.

Telephone Interview

In the interests of advancing this application to issue the Examiner is invited to telephone the undersigned to discuss the foregoing or any suggestions that the Examiner may have to place the case in condition for allowance.

CONCLUSION

Claims 1, 2 and 4-9 remain in the application. **Claims 1 and 9** have been amended to correct antecedence, define abbreviations and to include subject matter from **claim 3**. **Claim 3** has been cancelled. The amendments to **claims 1 and 9** do not require a new search.

For at least the foregoing reasons, the application is in condition for allowance. Accordingly, an early indication thereof is respectfully requested.

Respectfully submitted,

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